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Trauma and associated factors in Türkiye national medical rescue team (UMKE) employees after Kahramanmaraş earthquakes: A six-month follow-up study

Six-month follow-up of trauma in UMKE employees

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Abstract

Aim: To investigate the trauma and related symptoms experienced by Türkiye National Medical Rescue Team (UMKE) employees following earthquakes in Kahramanmaraş.

Material and Methods: Twenty-five males (78.1%) and five females (21.9%) were included in the study. A sociodemographic form and clinical data form, DSM-5 Acute Stress Symptom Severity Scale, DSM-5 Trauma Symptom Checklist, Beck Anxiety, and Beck Depression Scales were administered to UMKE employees who completed a one-week of duty in the earthquake-affected area. The assessments were conducted online during the first week and the first, third, and sixth months.

Results: Upon examining the psychiatric scale scores of the participants over time, there was a decrease in Acute Stress Symptom Severity Scale scores, DSM-5 Trauma Symptom Checklist, and Beck Depression Scale, but a statistically significant decrease was not observed ($p>0.05$). Among factors associated with psychiatric conditions, participants with a previous psychiatric diagnosis had higher Beck Anxiety Scale scores ($p=0.05$), and those who had experienced a traumatic event had higher Acute Stress Symptom Severity Scale scores ($p=0.039$).

Discussion: The study sheds light on the enduring psychological impact on emergency response teams, emphasizing the importance of long-term mental health support following natural disasters. Increasing awareness, proactive monitoring, and effective treatment strategies are demonstrated as essential in addressing the mental health issues faced by those actively involved in disaster relief efforts.

Keywords

Anxiety, Depression, Earthquake, Emergency Response Teams, Post-Traumatic Stress Disorder

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Introduction

Natural disasters are major catastrophes that affect the lives of individuals and societies. Earthquakes are one of the most terrifying, devastating, and uncontrollable disasters. They are often highly destructive and lead to significant loss of life and economic damage [1].

Effective emergency response and coordination of healthcare services are vital for saving lives and treating the injured during and after these disasters. Search and rescue operations, one of the top priorities following an earthquake, are carried out immediately by professional teams [2].

On February 6, 2023, at 04:17 and 13:24 local time, two earthquakes with magnitudes of with magnitude of Mw 7.8 and Mw 7.6, centered in Pazarcık and Ekinözü in Kahramanmaraş, occurred. These earthquakes caused severe damage in Kahramanmaraş and 11 other provinces, significantly losing life [3].

Healthcare workers involved in earthquake response during the early stages of disasters are exposed to horrific scenes, including corpses, severely injured individuals, and people in pain. Therefore, the teams providing this initial response are more vulnerable to professional stress compared to others [4]. The Türkiye National Medical Rescue Team (UMKE) employees also encounter traumatic experiences in the aftermath of earthquake disasters and must cope with the long-term effects of these experiences. Studies have indicated that survivors are often at risk for Post-Traumatic Stress Disorder (PTSD), depression, and other psychological disorders [5]. During this period, various factors that can be protective or predisposing to trauma and stress have been identified [6]. However, the examination of factors associated with acute stress symptoms during the initial moments of an earthquake and the acquisition of long-term follow-up data are limited.

This study aimed to follow UMKE employees who worked during the acute period following the two major earthquakes centered in Kahramanmaraş on February 6 and worked there for one week. They were followed for a period of six months to investigate trauma and related symptoms.

Material and Methods

Type of Study

Cross-sectional and follow-up study.

The Population and Sample Size of the Study

The study sample consisted of individuals aged 18-65 who volunteered to participate in the research, met the inclusion and exclusion criteria, and participated in all follow-ups among those who worked at Sakarya UMKE during the Kahramanmaraş earthquake.

Measures

Socio-demographic form and clinical data form

This scale was determined based on the purpose of the study by reviewing the literature and includes inquiries about individuals' social support, economic status, and previous psychiatric treatment.

DSM-5 Acute Stress Symptom Severity Scale

Published by the American Psychiatric Association, this scale is used to assess the severity of acute stress disorder symptoms in individuals aged 18 and over. The Turkish validity and reliability study was conducted by Aşçıbaşı et al. The scale consists of 7 items, each evaluating the severity of acute stress disorder experienced over the past seven days. Designed on a 5-point Likert scale, the scale ranges from 0 to 28 points, with higher scores indicating more severe acute stress symptoms. The validity and reliability of the scale were established, with a Cronbach's Alpha of 0.95 [7].

DSM-5 Trauma Symptom Checklist (PCL-DSM-5)

PTSD Checklist, also known as the Trauma Symptom Checklist, is one of the most commonly used screening tools for assessing PTSD symptomatology. It is rated on a five-point Likert scale (0-4 points) and provides a range of scores from 0 to 80. Comprising 20 items, this self-report scale has been expanded from the previous DSM-IV version. PCL-5 corresponds to the PTSD diagnostic criteria in DSM-5, including re-experiencing (Criterion B), avoidance (Criterion C), negative alterations in cognitions and mood (Criterion D), and hyperarousal (Criterion E) [8]. A Turkish validity and reliability study was conducted, and a cutoff score of ≥47 was recommended for the diagnosis of PTSD, with a sensitivity of .76 and specificity of .69 [9].

Beck Anxiety Scale

This self-assessment scale consists of 21 items and is widely used to determine the frequency and severity of anxiety symptoms [10]. Validity and reliability studies were conducted in Türkiye by Ulusoy et al. [11].

Beck Depression Scale

This scale measures the risk, severity, and depression change in the adult population [12]. Hisli conducted the Turkish validity and reliability study, and the recommended cutoff score for the scale is 17 [13].

Data Processing

In this study, the measurement tools mentioned above were administered online via Google Forms to UMKE employees who completed one week of duty in the earthquake-affected area during the acute phase and in the 1st week, 1st, 3rd, and 6th months following the earthquake. During the measurements, individuals with high psychiatric scores were contacted by phone and informed, and a recommendation was made for them to consult a psychiatric specialist.

Statistical analysis

Statistical analyses were performed using SPSS version 22. Descriptive statistics (frequency and percentage) were applied for socio-demographic variables, and the chi-square test was used for categorical variables. Independent sample t-tests and one-way ANOVA were employed to compare means in groups that showed normal distribution. At the same time, the Mann-Whitney U and Kruskal-Wallis tests were used for groups that did not exhibit normal distribution. If the Mauchly's Test of Sphericity value was less than 0.05, the Greenhouse-Geisser value was examined. If the Greenhouse-Geisser value is less than 0.750, the evaluation was made with the Greenhouse-Geisser test. A p-value of ≤ 0.05 was considered statistically significant.

Ethical approval

Ethical approval was obtained from the local Ethics Committee of Sakarya University (Date: 2023-02-10, No: E-220599-58).

Results

Sociodemographic data

It was determined that 78.1% of UMKE employees participating

Table 1. Numbers and rates of participants who scored above the threshold on the scales

Risk group (higher than cut off value)	1st evaluation (2 weeks after)	2nd evaluation (4 weeks after)	3rd evaluation (12 weeks after)	4th evaluation (24 weeks after)	(x2;p)
Acute Stress Symptom Severity Scale (>13)	7 (21,9)	2 (8,7)	0 (0)	5 (17,2)	(7,47: 0,058)
Trauma Symptom Checklist (>46)	4 (12,5)	2 (8,7)	2 (7,1)	1 (3,4)	(1,73:0,630)
Beck Anxiety Scale (>25)	4 (12,5)	0 (0)	5 (17,9)	4 (13,8)	(4.24:0,236)
Beck Depression Scale (>16)	8 (25)	6 (26,1)	6 (21,4)	8 (27,6)	(0,30:0,958)

Table 2. Sociodemographic characteristics and their effects on scale scores

	Group with past psychiatric diagnosis, n=3	Group without past psychiatric diagnosis, n=29	Statistics	p
Beck Anxiety Scale scores mean ± SD	25,66 ± 15,37	9,39 ±10,92	U = 73.5	0.05
	Group with a history of traumatic events, n=12	**Group with no history of traumatic events, n=20**	**Statistics**	**p**
Acute Stress Symptom Severity Scale scores mean ± SD	11,66 ± 2,87	8,45 ± 4,63	t=-2,159	0.039

Table 3. Pairwise comparison of scale scores of UMKE employees

			Statistics	p
ASSS (1-2) mean ± SD	9,39 ± 4,92	8,82 ± 3,98	t= .771	.449
ASSS (1-3) mean ± SD	9,39 ± 4,92	8,00 ± 3,87	t= 2.312	.029
ASSS (1-4) mean ± SD	9,39 ± 4,92	7,55 ± 5,17	t= 2.162	.039
TSC (1-2) mean ± SD	25,69 ± 16,13	25,04 ± 19,95	t=.294	.772
TSC (1-3) mean ± SD	25,69 ± 16,13	25,17 ± 17,76	t=.679	.503
TSC (1-4) mean ± SD	25,69 ± 16,13	20,31 ± 15,84	t= 2.005	.055
BAS (1-2) mean ± SD	9,75 ± 11,96	7,90 ± 6,95	t= 1.010	.323
BAS (1-3) mean ± SD	9,75 ± 11,96	13,25 ± 14,75	t= -.505	.618
BAS (1-4) mean ± SD	9,75 ± 11,96	8,98 ± 5,17	t=.902	.375
BDS (1-2) mean ± SD	10,60 ± 9,06	11,73 ± 9,30	t= -.789	.439
BDS (1-3) mean ± SD	10,60 ± 9,06	10,57 ± 11,56	t=.674	.506
BDS (1-4) mean ± SD	10,60 ± 9,06	9,51 ± 10,18	t= 1.209	.237

ASSS: Acute Stress Symptom Severity Scale, TSC: Trauma Symptom Checklist, BAS: Beck Anxiety Scale, BDS: Beck Depression Scale, 1-2: First Evaluation and Second Evaluation, 1-3: First Evaluation and Third Evaluation, 1-4: First Evaluation and Fourth Evaluation

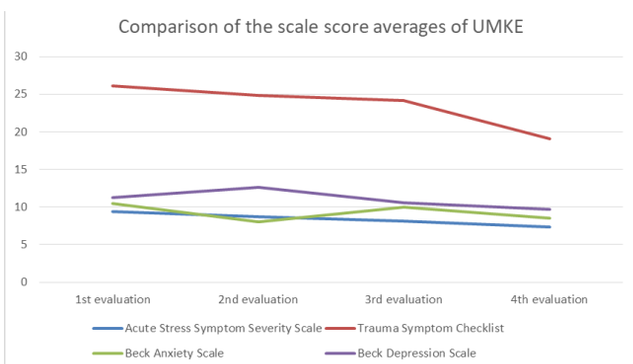

Figure 1. Changes in scale scores over time

in the study were men, 21.9% were women, 56.3% were married, 6.3% were divorced, 34.4% were single, 3.1% were living separately, 9.4% were paramedics, 12.5% were emergency medical technicians, 18.8% were doctors, 12.5% were midwives and nurses, 15.6% were health officers, and 31.3% were technicians, 40.6% worked both in the Field Hospital and the debris field, 34.4% worked in the Field Hospital, 18.8% worked in the debris field, and 6.3% worked in other areas.

Participants' psychiatric scale scores and their change over time

Participants filled out online forms 2 weeks, 1 month, 3 months, and 6 months after going to the earthquake region, and their scale scores were compared. The graph showing the change in participants' scale scores over time is given in Figure 1.

According to the scale results, the rates of those who were determined to be in the risk group were compared. No statistically significant difference was found (Table 1). When the Acute Stress Symptom Severity Scale scores of UMKE employees were compared, it was determined that there was a decrease in the scores during the follow-up period. Still, there was no statistically significant difference between the mean scores. (Since the values did not show a normal distribution, the Friedman test was used, X2 = 4.563, p = 0.207)

When the PTSD Checklist Scale scores of UMKE employees were compared, it was determined that there was a decrease in the scores during the follow-up period. Still, there was no statistically significant difference between the mean scores. (The data were examined using the Repeated Measures ANOVA test. Since Mauchly's Test of Sphericity value was 0.019 < 0.05, the Greenhouse-Geisser value was examined. Since the Greenhouse-Geisser value was 0.671 < 0.750, the evaluation was made with the Greenhouse-Geisser test. (F (2 40) = 2.101, p = 0.135))

When the Beck Anxiety Scale scores of UMKE employees were compared, it was determined that the scores first decreased and then increased during the follow-up period. There was no statistically significant difference between the score averages. (Since the values did not show a normal distribution, the Friedman test was used, X2 = 0.503, p = 0.918)

When the Beck Depression Scale scores of UMKE employees were compared, it was determined that there was no continuous decrease in the scores during the follow-up period, and there was no statistically significant difference between the mean scores. Since the values did not show a normal distribution, the Friedman test was used (X2 = 1.485, p = 0.686).

Factors associated with participants' psychiatric states

When the participants were divided into subgroups according to their sociodemographic characteristics and compared with the scores they received from the scales in the first evaluation, the Beck Anxiety Scale scores (U = 73.5, p = 0.05) were found to be higher in those with a previous psychiatric diagnosis. Acute Stress Symptom Severity Scale scores were higher in those who experienced a traumatic event (t=-2.1, p=0.039) (Table 2). Comparing UMKE employees with a monthly income of above and below 20,000 TL showed no statistically significant

difference between the groups (p>0.05). When UMKE employees were grouped and compared as those working in the debris field and those not working, no statistically significant difference was detected between the groups (p>0.05).

A statistically significant decrease in the average Acute Stress Symptom Severity Scale scores was observed between the first and third evaluations and between the first and fourth evaluations. No significant difference was detected between the scale score averages in the other evaluations (p>0.05) (Table 3).

Discussion

In this study, we followed UMKE employees who served in the acute period and completed their one-week duty after the two major earthquakes centered in Kahramanmaraş on February 6, 2023, to investigate their trauma and related symptoms for six months. In this study, face-to-face evaluations were not conducted to make a psychiatric diagnosis, but acute stress reaction, PTSD, anxiety, and depression screening scales were used to evaluate the mental states of the participants.

The comparison of UMKE employees in the debris field with those in other fields revealed no statistically significant difference in terms of cutoff values for acute stress response, PTSD, anxiety, and depression. In a study evaluating emergency medical technicians involved in search and rescue efforts in the Taiwan earthquake, it was shown that working hours and the population studied did not create a statistically significant difference in PTSD [14]. In Chang et al.'s study, it was stated that direct rescue was not associated with psychiatric morbidity or post-traumatic morbidity in rescue workers working in the 1999 Taiwan earthquake, but contact with dead bodies was significantly associated with psychiatric and post-traumatic morbidity [15]. It can be said that the fact that the participants in our study encountered similar cases in both the debris field and the field hospital and similar working conditions caused no statistical difference.

It was determined that the rate of participants above the threshold for Acute Stress reaction was 21.9% immediately two weeks after the earthquake; this decreased in subsequent evaluations. However, after six months, 17.2% of the participants still had symptoms above the cut-off value for acute stress reaction symptoms. In a study examining the effects of trauma on disaster workers, it was stated that the rate of acute stress disorder one week after the disaster was 25.6%. This situation led to depression and PTSD, and there were high rates of depression and PTSD in the third month and seventh months [16].

The rate of participants above the threshold in the evaluation made with the PTSD scale was 12.5% immediately two weeks after the earthquake. At the sixth month measurement, 3.4% of the participants had scores above the cut-off value for PTSD symptoms. In a study conducted among actively working people after a major earthquake in Japan, PTSD was found to be 34.2% after three months and 12.6% after 18 months [17]. In another study conducted two months after the 2003 Bingöl earthquake, the rate of PTSD in rescue workers was 25% [18]. In our study, the rate of participants whose PTSD scale score was above the threshold value was lower than in the literature. This difference may be due to the long-term follow-up of employees in rescue efforts.

The rate of those with Beck anxiety scale scores above the threshold was 13.8% at six months. On the Beck depression scale, 27.6% of the participants were above the depression threshold value in the 6th month. In a study conducted two months after the Taiwan earthquake, the anxiety rate of participants was 10.8%, and the depression rate was 14.9% [19]. In a study after the Bam earthquake, they found that the anxiety rate among Red Crescent employees was 7.1%, and the depression rate was 2.3% [20]. In their study, Fullerton et al. identified a depression rate of 16% in the seventh month, which increased to 21.7% in the thirteenth month [16]. This emphasizes the need for long-term follow-up of those involved in rescue efforts.

In the present investigation, individuals surpassing a designated threshold were proffered psychological assistance; however, none of the national medical rescue team personnel availed themselves of such support. Merely 2.3% to 18.3% of healthcare practitioners undergoing mental distress amid and after the pandemic actively pursued professional assistance [21]. Analogously, a mere 6.1% of rescue workers sought psychological intervention after encounters with terrorist attacks [22]. A prevailing rationale elucidated for the reluctance of health professionals contending with mental health challenges stemming from diverse origins to solicit support was articulated as a preference for autonomous problem resolution [23]. This underscores a concerning trend of underutilization of available psychological support services among healthcare and rescue workers.

In this study, a notable limitation is the small number of participants, the lack of online authentication during the study process, and the inability to conduct face-to-face evaluations due to the distance of the earthquake-affected region to the research area. However, on the other hand, the strength of the study lies in the comprehensive examination of volunteers for six months, taking into account both trauma and anxiety and depression dimensions.

Conclusion

This study has revealed elevated rates of psychiatric symptoms not only in the immediate acute phase following the earthquake but also in the follow-up assessments six months later. Factors associated with these symptoms include exposure to trauma, a history of previous depression, and, despite these findings, a low rate of seeking treatment. The findings underscore the need for heightened awareness and the development of action plans for both monitoring the mental well-being of disaster relief volunteers in the aftermath of earthquakes and other natural disasters and facilitating their access to effective treatment. Subsequent research efforts should be directed toward addressing these aspects.

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Scientific Responsibility Statement
The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and Human Rights Statement
All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or compareable ethical standards.

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Conflict of Interest
The authors declare that there is no conflict of interest.

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